



DiPrete Engineering

Stormwater System Operation & Maintenance Plan



Seasons Corner Market

Located in Cranston, RI

Applicant: Colbea Enterprises, LLC.

6-29-2022

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Operation & Maintenance Plan Overview

An essential component of a successful Stormwater System (SS) is the ongoing Operation and Maintenance (O&M) of the various components of the stormwater drainage, control, and conveyance systems. These components include swales, pipes, catch basins, and treatment/ control devices are commonly referred to as Best Management Practices (BMPs). Failure to provide effective maintenance can reduce the hydraulic capacity and the pollutant removal efficiency of stormwater practices.

Many people expect that stormwater facilities will continue to function correctly forever. However, it is inevitable that deterioration of the stormwater system will occur once it becomes operational. The question is not whether stormwater system maintenance is necessary but how often.

This plan has been developed to proactively address operations and maintenance to minimize potential problems and maximize potential stormwater runoff treatment and management. Ongoing inspections and maintenance will extend the service life of the Best Management Practices.

This plan addresses:

1. Stormwater management system(s) owners;
2. The party or parties responsible for operation and maintenance, including how future property owners will be notified of the presence of the stormwater management system and the requirement for proper operation and maintenance;
3. A description and delineation of public safety features;
4. The routine (scheduled) and non-routine (corrective) maintenance tasks for each BMP to be undertaken after construction is complete and a schedule for implementing those tasks;
5. A plan that is drawn to scale and shows the location of all stormwater BMPs in each treatment train along with the discharge point;
6. An estimated operation and maintenance budget; and
7. Funding source for operation and maintenance activities and equipment.

A major contributor to unmaintained stormwater facilities is a lack of clear ownership and responsibility definition. In order for an inspection and maintenance program to be effective, the roles for each responsibility must be clearly defined prior to construction of a system. This can be accomplished with a maintenance agreement between the site owners and the responsible authority.

This report is suitable for recording as an attachment to a maintenance agreement between the site owner and the responsible authority. A copy of a sample agreement prepared by RIDEM is attached to this report as Appendix B.

Stormwater System Owner / Party Responsible for O&M

Stormwater BMPs are maintained during construction by the site contractor as identified in the Soil Erosion and Sediment Control Plan (SESC) for the site. A copy of the SESC is required to be kept on site during construction. The SESC requires maintenance and inspection of the BMPs during the construction phase of project and requires a log be kept of these activities. Once construction is complete and the contractor's warranty period is elapsed, the contractor must obtain the signature of the stormwater system's owner releasing the contractor from his maintenance and inspection responsibilities. A copy of this release of contractor's responsibility must be attached to this document.

The property owner will also be the owner of the stormwater system. Upon completion of construction, the owner of the property along with mailing and emergency contact information must be added below.

Owner: _____

Mailing Address: _____

Emergency Contact Name: _____

Phone: _____

Transfer of Ownership

In the event that the owner of the property changes, the current owner (grantor) must provide a copy of this document to the new owner (grantee). The new owner must notify the Rhode Island Department of Environmental Management of the change of ownership and provide a signed updated Operations and Maintenance Plan to the Rhode Island Department of Environmental Management.

The Stormwater System Owner is the Party Responsible for the ongoing O&M of the system.

The two key components to adequately maintain the stormwater infrastructure are:

1. Performance of periodic and scheduled inspections
2. Performance of scheduled maintenance

The actual operation and maintenance of the system may be performed by a third party designated by the owner. If the owner contracts with a third party for O&M the name, address, and emergency contact information must be added below, and updated if the third party designee changes.

Name: _____

Mailing Address: _____

Emergency Contact Name: _____

Phone: _____

Public Safety

Public safety was a critical factor in designing the stormwater system. Public safety features included in this design are:

- Accessibility to Stormwater BMPs
- Winter & Non-Winter Maintenance

Accessibility to Stormwater BMPs

As shown on the site plans, all stormwater BMPs are accessible from within the paved areas or directly adjacent to paved areas.

Winter Maintenance

The following tasks must be performed to protect public safety during the winter season:

- Roadways and parking lots will be salted/ sanded/ plowed in accordance with applicable City of Cranston and RIDOT guidelines;
- Inspect the open and closed drainage networks adjacent to the snow stockpiles to ensure they are free of clogging and debris;
- Inspect roadways and drainage structures post-storm event to alleviate any signs of icing or damming.

Non-Winter Maintenance

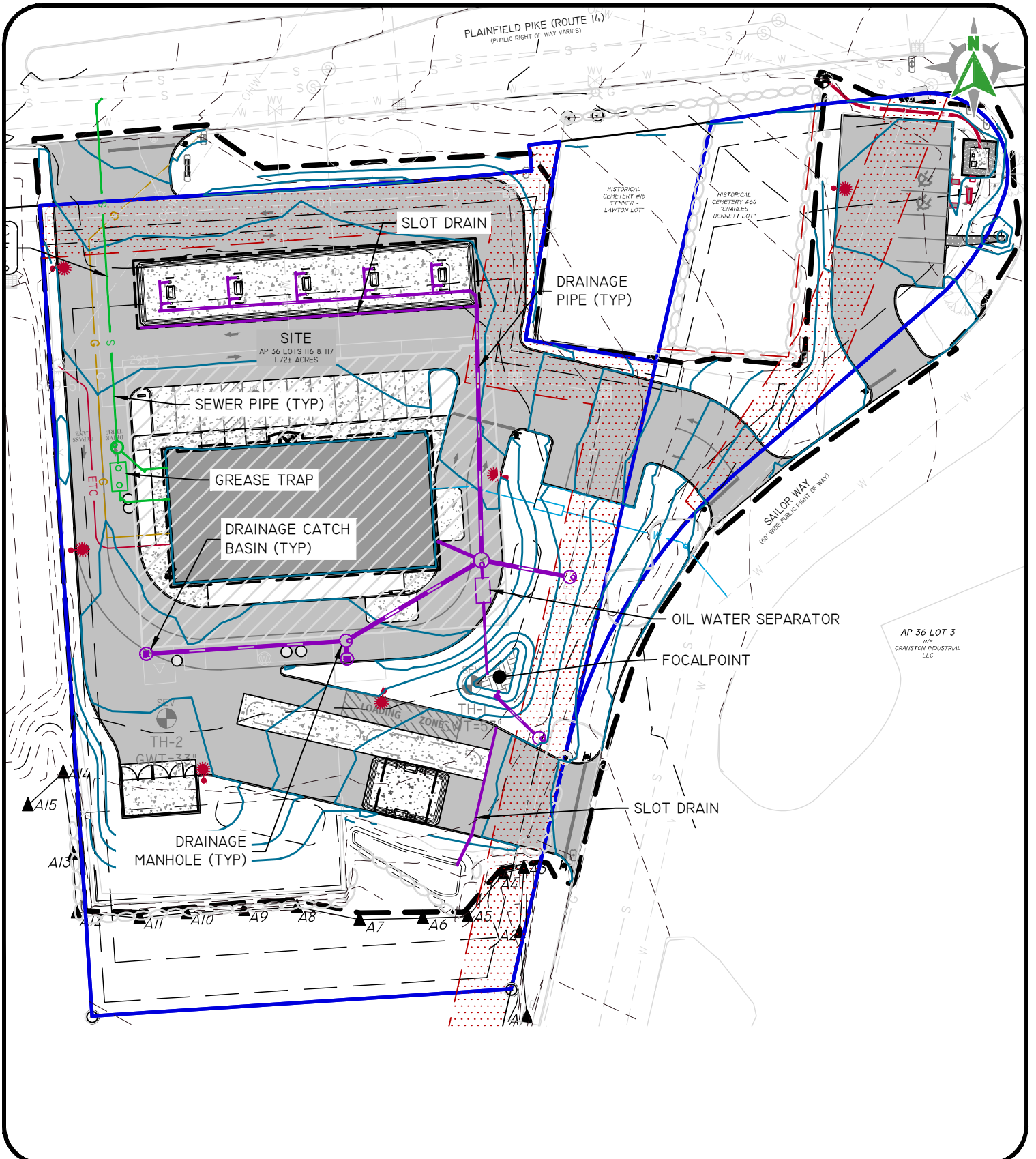
The following tasks must be performed to protect public safety during the non-winter seasons:

- Roadways and parking lots will be swept in accordance with applicable City of Cranston and RIDOT guidelines;
- The stormwater management systems must be inspected and maintained in accordance with the enclosed Operations & Maintenance Plan.

Particular care must be taken in the operation and maintenance of these features.

Stormwater System Plan

A plan identifying each component of the stormwater system is included on the following page.



SHEET
OF 1

OPERATIONS & MAINTENANCE SEASONS CORNER MARKET CITY/TOWN, RHODE ISLAND

PREPARED FOR:

COLBEA ENTERPRISES, LLC
2050 PLAINFIELD PIKE, CRANSTON, RHODE ISLAND 02921

DATE:
06-29-2022



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Inspections & Maintenance

Inspections must be performed on a regular basis and scheduled based on the BMP type and configuration. It is not mandatory that all inspectors be trained engineers, but they must have some knowledge or experience with stormwater systems and in general, trained stormwater engineers should direct the inspectors. Follow-up inspections by registered professional engineers must be performed where a routine inspection has revealed a question of structural or hydraulic integrity affecting public safety.

Not all inspections can be conducted by direct human observation. For subsurface systems, video equipment may be required. There may be cases where other specialized equipment is necessary. The inspection program must be tailored to address the operational characteristics of the system.

The inspection process must document observations made in the field and must cover structural conditions, hydraulic operational conditions, evidence of vandalism, condition of vegetation, occurrence of obstructions, unsafe conditions, and build-up of trash, sediments and pollutants.

Maintenance of the stormwater management system is essential and can be divided into two types, scheduled and corrective.

Scheduled maintenance tasks are those that are typically accomplished on a regular basis and can generally be scheduled without referencing inspection reports. These items consist of such things as vegetation maintenance (such as mowing) and trash and debris removal. These tasks are required at well-defined time intervals and are a requirement for all stormwater structural facilities.

Corrective maintenance tasks consist of items such as sediment removal, stream bank stabilization, and outlet structure repairs that are done on an as-needed basis. These tasks are typically scheduled based on inspection results or in response to complaints.

Since specialized equipment may be required, some maintenance tasks can be effectively handled on a contract basis with an outside entity specializing in that field. In addition, some maintenance may also require a formal design and bid process to accomplish the work.

Appendix A provides an "Inspection Schedule & Maintenance Checklist" for the stormwater system components on this site. Completed checklists must be maintained as an ongoing record of inspections for each component of the stormwater system.

In addition to the maintenance of the stormwater system, maintenance of other site improvements can significantly enhance the ability for the BMPs to function as designed. Several of these have been listed below, along with the recommended maintenance.

Lawn, Garden and Landscape Management

- Lawns should be cut no shorter than 1-1/2" in the spring and fall to stimulate root growth, and no shorter than 2 to 3 inches throughout the summer.
- Infiltration ponds should be mowed at least twice per year.
- Fertilize no more than twice per year, once in May-June and once in September-October.
- Avoid spreading fertilizer on impervious surfaces.
- Weeds should be dug or pulled out. Large areas of weeds can be removed by covering with large plastic sheet(s) for a few days.
- Chemical pesticides should be used as a last resort. A healthy lawn is naturally disease resistant.
 - Visible insects can be removed by hand, by spraying with water, or even vacuum cleaning.
 - Store bought traps, specific for a species, can be used.
 - Slugs and other soft bodied insects can be eliminated using diatomaceous earth.
 - Plants infected with bacteria and fungi should be removed and disposed of.
 - Beneficial organisms should be maintained on the property and should be encouraged/ attracted to the property. Homeowners and property facility maintenance personal should become familiar with beneficial organisms.
- Irrigation should be minimal if required at all. Most lawns do not require watering and will become dormant during dry periods.
 - Established lawns require no more than one inch of water per week.
 - Areas should be watered before 9am to avoid evaporation.

Road and Parking Area Management

Street and Parking Lot Sweeping

- All street and parking areas on site must be swept a minimum of 2 times per year.

Deicing:

- Salt storage areas must be completely covered and located on an impervious surface.
- Runoff must be contained in appropriate areas.
- See The Rhode Island Stormwater Design and Installation Standards Manual Appendix G for approved deicing agents and ways to reduce deicer impacts. The manual Appendices can be found online at:
<http://www.dem.ri.gov/programs/benviron/water/permits/ripdes/stwater/pdfs/swdsnapd.pdf>

Sealants:

- Only asphalt based sealants are permitted, no coal-tar based asphalt sealants can be used on site.

Snow Removal:

- Snow must not be dumped in any water body including rivers, reservoirs, ponds, lakes, wetlands, bays, or the ocean.
- Avoid disposing of snow on top of storm drain catch basins or stormwater drainage swales or ditches.
- Snow must be stored in upland areas, not in or adjacent to water bodies or wetlands. Snow must be stored in a location that will allow snow melt and enter the onsite drainage system so it can be treated by onsite BMPs.

Solid Waste Containment

- Trash and recycling receptacles must be located onsite for all commercial areas.

FocalPoint HBMBS Devices

- Stormwater system owner must enter into a maintenance contract which extends for a minimum of two years. The contracted maintenance provider must receive training by Convergent Water Technologies on how to properly maintain Focal Point HPMBS devices. See Appendix C for Maintenance Letter of Intent.

Reference; *Additional information relating to operation and maintenance of specific BMPs can be found in the Rhode Island Stormwater Design and Installation Standards Manual.*

www.dem.ri.gov/pubs/regs/regs/water/swmanual.pdf

Estimated Inspections & Maintenance Budget

It is important to be able to budget for the O&M costs associated with the stormwater system. To assist the owner in budgeting, below is an estimate of the costs that may be incurred in maintaining the system. The costs have been estimated on a Yearly basis.

FocalPoint Biofiltration:

For a 25 year finance period, Bio Retention cells cost approximately \$1,847.53 per acre of tributary area per year. The site contains approximately 0.642 acres of area flowing to the FocalPoint. This equates to an approximate cost of \$1,186.11 per year to maintain the FocalPoint.

Bioretention Area (Existing)

For a 25 year finance period, Bio Retention cells cost approximately \$1,847.53 per acre of tributary area per year. The site contains approximately 0.124 acres of area flowing to Bioretention. This equates to an approximate cost of \$229.00 per year to maintain the Bioretention area.

Oil/Water Separator:

For a Cascade Separator unit and an Oil/Water Separator, the total cost for an inspection and cleanout is approximately \$1,500, depending on the amount of accumulated solids. For an annual period for one oil/water separator, the estimated cost for inspection and maintenance is \$1,500 x 1 unit x 2 times per year = \$3,000.

Based on the costs outlined above, the stormwater system will cost approximately \$4,415.11 per year to maintain. This is only an estimate and costs may vary.

These costs are the responsibility of the stormwater system owner. Funding for the costs will be provided by the owner.

Reference; *Maintenance costs are based on information provided by Horsley Witten during the January 19, 2011 Stormwater Manual Training.*

(<http://www.dem.ri.gov/programs/benviron/water/permits/ripdes/stwater/t4guide/slides/sess210.ppt>)

Appendix A – Inspection Schedule & Maintenance Checklists

Street Sweeping Operation, Maintenance, and Management Inspection Checklist

Project:

Date:

Location:

Time:

Site Status:

Inspector:

Notes:

- Beyond inspection frequency noted in parenthesis, i.e. (quarterly), inspections shall be completed after storms equal to or greater than the 1-year 24-hour Type III storm event (2.7" of rain fall)
- All Checklist Maintenance items are MANDATORY.
- During inspections, if maintenance items are found not to be applicable, note as N/A in comments
- All removed sediments shall be disposed at an approved and permitted location.
- All hazardous debris removed shall be disposed of in accordance with state and federal regulations by a properly licensed contractor

MAINTENANCE ITEM	SATISFACTORY (YES/NO)	COMMENTS
Sweep all driveways and parking lots two times per year. One of these sweepings must occur after winter sanding operations have concluded.		

COMMENTS:

**Street Sweeping
Operation, Maintenance, and Management
Inspection Checklist**

Project:	Date:
Location:	Time:
Site Status:	Inspector:

ACTIONS TO BE TAKEN:

**Drainage Structures
(Catch Basins, Manholes, etc.)
Operation, Maintenance, and Management
Inspection Checklist**

Project:

Date:

Location:

Time:

Site Status:

Inspector:

Notes:

- Beyond inspection frequency noted, inspections shall be completed after storms equal to or greater than the 1-year 24-hour Type III storm event (2.7" of rain fall)
- All Checklist Maintenance items are MANDATORY.
- During inspections, if maintenance items are found not to be applicable, note as N/A in comments
- All removed sediments shall be disposed at an approved and permitted location.
- All hazardous debris removed shall be disposed of in accordance with state and federal regulations by a properly licensed contractor

MAINTENANCE ITEM	SATISFACTORY (YES/NO)	COMMENTS
Semi-annually inspect drainage structures for damage		
Use a vacuum truck or other means to clean out any sediment or debris present in any drainage structure or whenever sediments reach ½ of the sump depth, which ever comes first.		
Semi-annually inspect drainage structures for debris and remove as necessary		
Semi-annually inspect the slot drains and clean the grates as necessary to ensure full capture capacity is maintained.		

**Drainage Structures
(Catch Basins, Manholes, etc.)
Operation, Maintenance, and Management
Inspection Checklist**

Project:

Date:

Location:

Time:

Site Status:

Inspector:

COMMENTS:

ACTIONS TO BE TAKEN:

Oil Water Separator Operation, Maintenance, and Management Inspection Checklist

Project:

Date:

Location:

Time:

Site Status:

Inspector:

Notes:

- Beyond inspection frequency noted in parenthesis, i.e. (quarterly), inspections shall be completed after storms equal to or greater than the 1-year 24-hour Type III storm event (2.7" of rain fall)
- All Checklist Maintenance items are MANDATORY.
- During inspections, if maintenance items are found not to be applicable, note as N/A in comments
- All removed sediments shall be disposed at an approved and permitted location.
- All hazardous debris/liquids removed shall be disposed of in accordance with state and federal regulations by a properly licensed contractor

MAINTENANCE ITEM	SATISFACTORY (YES/NO)	COMMENTS
1. Debris Cleanout (Semi-Annual)		
Sediment chamber clear of debris and accumulated sediment		
Greater than 50% of the storage volume remaining (sediment depth = 18")		
Remove sediment by vactoring (vacuuming)		
Oil Separation chamber clear of fuel/oil		
2. Aggregate Repairs (Annually)		
Annual inspection for damage		
Inlet and outlet pipes in good condition		

**Oil Water Separator
Operation, Maintenance, and Management
Inspection Checklist**

Project:

Location:

Site Status:

Date:

Time:

Inspector:

3. In the Event of a Fuel Spill		
Device to be emptied and cleaned		

COMMENTS:

**Oil Water Separator
Operation, Maintenance, and Management
Inspection Checklist**

Project:	Date:
Location:	Time:
Site Status:	Inspector:

ACTIONS TO BE TAKEN:

FocalPoint System Operation, Maintenance, and Management Inspection Checklist

Project:

Date:

Location:

Time:

Site Status:

Inspector:

Notes:

- During the first six months following construction bioretention facilities should be inspected at least twice following precipitation events of at least 1.0 inch to ensure that the system is functioning properly. Beyond inspection frequency noted in parenthesis, i.e. (quarterly), inspections shall be completed after storms equal to or greater than the 1-year 24-hour Type III storm event (2.7" of rain fall)
- All Checklist Maintenance items are MANDATORY.
- During inspections, if maintenance items are found not to be applicable, note as N/A in comments
- All removed sediments shall be disposed at an approved and permitted location.
- All hazardous debris removed shall be disposed of in accordance with state and federal regulations by a properly licensed contractor
- All mulch used must be double shredded, aged hardwood mulch.
- When filtering capacity diminishes substantially (i.e., when water ponds on the surface of the filter bed for more than 48 hours), the top few inches of discolored material shall be removed and shall be replaced with fresh material. Sediment shall be disposed of in an acceptable manner at an approved and permitted location.

MAINTENANCE ITEM	SATISFACTORY (YES/NO)	COMMENTS
1. Debris Cleanout (Quarterly)		
FocalPoint and contributing areas clean of debris including yard waste, litter and limbs		
Overflow Weir / outlet area clear of debris		
2. Sedimentation (Quarterly)		
Obvious trapping of sediment		

FocalPoint System Operation, Maintenance, and Management Inspection Checklist

Project:

Date:

Location:

Time:

Site Status:

Inspector:

Removal of sediment when depth is greater than 1.0 inches over filter media bed.		
Upon sediment removal, measure height from top of soil media (bottom of mulch layer) to overflow outlet. Height for this project is 12" . If the height is greater than specified, replacement media to be added to meet specified height. Mulch layer must also be replaced to a height of 3" after sediment removal.		
Upstream manhole with sump to be cleaned/pumped out when 50% or more of the sump storage is filled or displaced.		
3. Vegetation (Quarterly)		
<p>If there are plantings within the bioretention areas:</p> <ul style="list-style-type: none"> Plant composition according to approved plans. <p>No placement of inappropriate plants</p>		
If there is grass, grass height not greater than 10 inches.		
The mulch layer should be replenished (to the original depth) every other year, as directed by inspection records. The previous mulch layer should be removed, and properly disposed of, or roto-tilled into the soil surface.		
Seasonally plants may need to be watered, mulch added to void areas, treating of diseased trees and shrubs, inspection of soil and repair eroded areas, and removal of litter and debris.		

**FocalPoint System
Operation, Maintenance, and Management
Inspection Checklist**

Project:

Date:

Location:

Time:

Site Status:

Inspector:

Every 3 years pruning or replacement of wood vegetation.		
If 50% of vegetation coverage is not established after 2 years reinforcement planting is required.		
4. Embankments (Quarterly)		
Evidence of erosion		
Slopes stabilized with vegetation, slope protection, riprap, etc		

FocalPoint System
Operation, Maintenance, and Management
Inspection Checklist

Project:	Date:
Location:	Time:
Site Status:	Inspector:

COMMENTS:

ACTIONS TO BE TAKEN:



FocalPoint

BIOFILTRATION SYSTEMS

HIGH PERFORMANCE MODULAR BIOFILTRATION SYSTEM (HPMBS)

Operations & Maintenance



GENERAL DESCRIPTION

The following general specifications describe the general operations and maintenance requirements for the FocalPoint® High Performance Modular Biofiltration System (HPMBS). The system utilizes physical, chemical and biological mechanisms of a soil, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. The treatment system is a fully equipped, modular, constructed in place system designed to treat contaminated runoff.

Stormwater enters the FocalPoint® HPMBS, is filtered by the High Flow Biofiltration Media and passes through to the underdrain/storage system where the treated water is detained, retained or infiltrated to sub-soils, prior to discharge to the storm sewer system of any remaining flow.

Higher flows bypass the FocalPoint® HPMBS via a downstream inlet or other overflow conveyance. Maintenance is a simple, inexpensive and safe operation that does not require confined space entry, pumping or vacuum equipment, or specialized tools. Properly trained landscape personnel can effectively maintain FocalPoint® HPMBS by following instructions in this manual.



BASIC OPERATIONS

FocalPoint® is a modular, high performance biofiltration system that often works in tandem with other integrated management practices (IMP). Contaminated stormwater runoff enters the biofiltration bed through a conveyance swale, planter box, or directly through a curb cut or false inlet. Energy is dissipated by a rock or vegetative dissipation device and is absorbed by a 3-inch layer of aged, double shredded hardwood mulch, with fines removed, (when specified) on the surface of the biofiltration media.

As the water passes through the mulch layer, most of the larger sediment particles and heavy metals are removed through sedimentation and chemical reactions with the organic material in the mulch. Water passes through the biofiltration media where the finer particles are removed and numerous chemical reactions take place to immobilize and capture pollutants in the soil media.

The cleansed water passes into the underdrain/storage system and remaining flows are directed to a storm sewer system or other appropriate discharge point. Once the pollutants are in the soil, bacteria begin to break down and metabolize the materials and the plants begin to uptake and metabolize the pollutants. Some pollutants such as heavy metals, which are chemically bound to organic particles in the mulch, are released over time as the organic matter decomposes to release the metals to the feeder roots of the plants and the cells of the bacteria in the soil where they remain and are recycled. Other pollutants such as phosphorus are chemically bound to the soil particles and released slowly back to the plants and bacteria and used in their metabolic processes. Nitrogen goes through a variety of very complex biochemical processes where it can ultimately end up in the plant/bacteria biomass, turned to nitrogen gas or dissolves back into the water column as nitrates depending on soil temperature, pH and the availability of oxygen. The pollutants ultimately are retained in the mulch, soil and biomass with some passing out of the system into the air or back into the water.

DESIGN AND INSTALLATION

Each project presents different scopes for the use of FocalPoint® HPMBS. To ensure the safe and specified function of this stormwater BMP, Convergent Water Technologies and/or its Value Added Resellers (VAR) review each application before supply. Information and design assistance is available to the design engineer during the planning process. Correct FocalPoint® sizing is essential to optimum performance. The engineer shall submit calculations for approval by the local jurisdiction when required. The contractor and/or VAR is responsible for the correct installation of FocalPoint® HPMBS units as described in approved plans. A comprehensive installation manual is available at www.convergentwater.com.





MAINTENANCE

Why Maintain?

All stormwater treatment systems require maintenance for effective operation. This necessity is often incorporated in your property's permitting process as a legally binding BMP maintenance agreement. Other reasons for maintenance include:

- Avoid legal challenges from your jurisdiction's maintenance enforcement program.
- Prolong the lifespan of your FocalPoint® HPMBS.
- Avoid costly repairs.
- Help reduce pollutant loads leaving your property.

Simple maintenance of the FocalPoint® HPMBS is required to continue effective pollutant removal from stormwater runoff before any discharge into downstream waters. This procedure will also extend the longevity of the living biofiltration system. The unit will recycle and accumulate pollutants within the biomass, but may also be subjected to other materials entering the surface of the system. This may include trash, silt and leaves etc. which will be contained above the mulch and/or biofiltration media layer. Too much silt may inhibit the FocalPoint's® HPMBS flow rate, which is a primary reason for system maintenance. Removal of accumulated silt/sediment and/or replacement of the mulch layer (when specified), is an important activity that prevents over accumulation of such silt/sediment.

When to Maintain?

Convergent Water Technologies and/or its VAR includes a 1-year maintenance plan with each system purchased. Annual included maintenance consists of two (2) scheduled maintenance visits. Additional maintenance may be necessary depending on sediment and trash loading (by Owner or at additional cost). The start of the maintenance plan begins when the system is activated for full operation. Full operation is defined as when the site is appropriately stabilized, the unit is installed and activated (by VAR), i.e., when mulch (if specified) and plantings are added.

Activation should be avoided until the site is fully stabilized (full landscaping, grass cover, final paving and street sweeping completed). Maintenance visits are scheduled seasonally; the spring visit aims to clean up after winter loads including salts and sands. The fall visit helps the system by removing excessive leaf litter.

A first inspection to determine if maintenance is necessary should be performed at least twice annually after storm events of greater than (1) one inch total depth (subject to regional climate). Please refer to the maintenance checklist for specific conditions that indicate if maintenance is necessary.

It has been found that in regions which receive between 30-50 inches of annual rainfall, (2) two visits are generally required. Regions with less rainfall often only require (1) one visit per annum. Varying land uses can affect maintenance frequency.



Some sites may be subjected to extreme sediment or trash loads, requiring more frequent maintenance visits. This is the reason for detailed notes of maintenance actions per unit, helping the VAR/Maintenance contractor and Owner predict future maintenance frequencies, reflecting individual site conditions.

Owners must promptly notify the VAR/Maintenance contractor of any damage to the plant(s), which constitute(s) an integral part of the biofiltration technology. Owners should also advise other landscape or maintenance contractors to leave all maintenance of the FocalPoint® HPMBs to the VAR/Maintenance contractor (i.e. no pruning or fertilizing).

EXCLUSION OF SERVICES

It is the responsibility of the owner to provide adequate irrigation when necessary to the plant(s) in the FocalPoint® HPMBs.

Clean up due to major contamination such as oils, chemicals, toxic spills, etc. will result in additional costs and are not covered under the VAR/Maintenance contractor maintenance contract. Should a major contamination event occur, the Owner must block off the outlet pipe of the FocalPoint® (where the cleaned runoff drains to, such as drop-inlet) and block off the point where water enters of the FocalPoint® HPMBs. The VAR/Maintenance contractor should be informed immediately.

MAINTENANCE VISIT SUMMARY

Each maintenance visit consists of the following simple tasks (detailed instructions below).

1. Inspection of FocalPoint® HPMBs and surrounding area
2. Removal of debris, trash and mulch
3. Mulch replacement
4. Plant health evaluation (including measurements) and pruning or replacement as necessary
5. Clean area around FocalPoint® HPMBs
6. Complete paperwork, including date stamped photos of the tasks listed above.

MAINTENANCE TOOLS, SAFETY EQUIPMENT AND SUPPLIES

Ideal tools include: camera, bucket, shovel, broom, pruners, hoe/rake, and tape measure. Appropriate Personal Protective Equipment (PPE) should be used in accordance with local or company procedures. This may include impervious gloves where the type of trash is unknown, high visibility clothing and barricades when working in close proximity to traffic and also safety hats and shoes.



Inspection of FocalPoint® HPMBS and surrounding area

Record individual unit before maintenance with photograph (numbered). Record on Maintenance Report (see example in this document) the following:

<input type="checkbox"/> Standing Water	yes no	<input type="checkbox"/> Damage to HPMBS System	yes no
<input type="checkbox"/> Is Bypass Inlet Clear?	yes no	<input type="checkbox"/> to Overflow conveyance	yes no

Removal of Silt / Sediment / Clay

Dig out silt (if any) and mulch and remove trash & foreign items.

<input type="checkbox"/> Silt / Clay Found?	yes no	<input type="checkbox"/> Leaves?	yes no
<input type="checkbox"/> Cups / Bags Found?	yes no	<input type="checkbox"/> Volume of material removed _____	(volume or weight)

Removal of debris, trash and mulch

After removal of mulch and debris, measure distance from the top of the FocalPoint® HPMBS engineered media soil to the flow line elevation of the adjacent overflow conveyance. If this distance is greater than that specified on the plans (typ. 6" - 12"), add media (not top soil or other) to recharge to the distance specified.

<input type="checkbox"/> Distance to media surface to flow line of overflow conveyance (inches) _____
<input type="checkbox"/> # of Buckets of Media Added _____

Mulch Replacement

Most maintenance visits require only replacement mulch (if utilized) which must be, aged, double shredded hardwood mulch with fines removed. For smaller projects, one cubic foot of mulch will cover four square feet of biofiltration bed, and for larger projects, one cubic yard of mulch will cover 108 square feet of biofiltration bed. Some visits may require additional FocalPoint® HPMBS engineered soil media available from the VAR/Contractor.

<input type="checkbox"/> Add double shredded, aged hardwood mulch which has been screened to remove fines, evenly across the entire biofiltration media bed to a depth of 3".
<input type="checkbox"/> Clean accumulated sediment from energy dissipation system at the inlet to the FocalPoint® HPMBS to allow for entry of trash during a storm event.

Plant health evaluation and pruning or replacement as necessary

Examine the plant's health and replace if dead or dying.
Prune as necessary to encourage growth in the correct directions

<input type="checkbox"/> Height above Grate (feet) _____	<input type="checkbox"/> Health	alive dead
<input type="checkbox"/> Width at Widest point (feet) _____	<input type="checkbox"/> Damage to Plant	yes no

Clean area around FocalPoint® HPMBS

<input type="checkbox"/> Clean area around unit and remove all refuse to be disposed of appropriately.
--

Complete paperwork

<input type="checkbox"/> Deliver Maintenance Report and photographs as appropriate.
<input type="checkbox"/> Some jurisdictions may require submission of maintenance reports in accordance with approvals.
<input type="checkbox"/> It is the responsibility of the Owner to comply with local regulations.



FocalPoint Warranty

Seller warrants goods sold hereunder against defects in materials and workmanship only, for a period of (1) year from date the Seller activates the system into service. Seller makes no other warranties, express or implied.

Seller's liability hereunder shall be conditioned upon the Buyer's installation, maintenance, and service of the goods in strict compliance with the written instructions and specifications provided by the Seller. Any deviation from Seller's instructions and specifications or any abuse or neglect shall void warranties.

In the event of any claim upon Seller's warranty, the burden shall be upon the Buyer to prove strict compliance with all instructions and specifications provided by the Seller.

Seller's liability hereunder shall be limited only to the cost or replacement of the goods. Buyer agrees that Seller shall not be liable for any consequential losses arising from the purchase, installation, and/or use of the goods.



Maintenance Checklist

<i>Element</i>	<i>Problem</i>	<i>What To Check</i>	<i>Should Exist</i>	<i>Action</i>
Inlet	Excessive sediment or trash accumulation	Accumulation of sediment or trash impair free flow of water into FocalPoint	Inlet free of obstructions allowing free flow into FocalPoint System	Sediments or trash should be removed
Mulch Cover	Trash and floatable debris accumulation	Excessive trash or debris accumulation.	Minimal trash or other debris on mulch cover	Trash and debris should be removed and mulch cover raked level. Ensure that bark nugget
Mulch Cover	Ponding of water on mulch cover	Ponding in unit could be indicative of clogging due to excessive fine sediment accumulation or spill of petroleum oils	Stormwater should drain freely and evenly over mulch cover.	Contact VAR for advice.
Plants	Plants not growing, or in poor condition	Soil/mulch too wet, evidence of spill. Pest infestation. Vandalism to plants.	Plants should be healthy and pest free.	Contact VAR for advice.
Plants	Plant growth excessive	Plants should be appropriate to the species and location of FocalPoint		Trim/prune plants in accordance with typical landscaping and



FocalPoint

BIOFILTRATION SYSTEMS

High Performance Modular Biofiltration System (HPMBS)
Installation Guide



Summary

FocalPoint High Performance Modular Biofiltration System (HPMBS) is a scalable biofiltration system which combines the efficiency of high flow rate engineered soils with the durability and modularity of an open cell underdrain/storage/infiltration system.

The following contents of this Installation Guide are the necessary steps required for FocalPoint HPMBS installation, and activation. In this guide you'll find detailed chapters with corresponding photos for each step, to improve ease of installation and your profitability on the project. You'll be advised about specific steps which require extra attention.

ALL STEPS MUST BE COMPLETED IN THE ORDER OUTLINED TO ENSURE A SUCCESSFUL FOCALPOINT INSTALLATION AND ACTIVATION.

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- 6. Install Inspection/Maintenance Port(s)
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- 8. Backfill Sides & Top with Bridging Aggregate
- 9. Place High Performance Biofiltration Soil
- 10. Place & Fill Gabion (If Specified)
- 11. Protect the System to be Activated Later
- 12. Activate the System **(REQUIRED)**
- 13. Plantings & Mulch
- 14. Performance Verification

General Notes

Be sure to contact your local Convergent Water Technologies Value Added Reseller (VAR) at least two weeks prior to installation. We will provide you with onsite installation support AT NO CHARGE in order to facilitate a successful installation.

All pictures, illustrations and instructions have been included to guide you through a typical installation. The approved engineering drawing should ALWAYS take precedence over these instructions.

It is advised that the FocalPoint HPMBS be installed after site stabilization, or when other landscaping is being done. The components of the FocalPoint system include an engineered, high-flow media that must be protected from site erosion and sediment. The easiest way to prevent this is to not install it until the final phase of construction.

However, if it is necessary that the system be installed prior to final stabilization, this guide provides instructions for our 'cap & seal' procedure that will protect the integrity of the system until activation is deemed appropriate (i.e., after the site is at least 90% stabilized). Failure to adequately protect the system will result in premature contamination and possible system failure.

Throughout this document you will see three types of notes:

TIP: Ideas to improve your efficiency and profitability on the installation

IMPORTANT: Steps that require extra attention

WARNING: Critical issues that **MUST** be handled correctly to ensure a successful installation



Pre-Construction Checklist

TOOLS YOU WILL NEED:

- Laser or Transit
- Measuring Tape (Long enough to mark FocalPoint HPMBS footprint)
- Razor Knife
- Screw Driver / Nut Driver Set
- String Line
- Marking Paint
- Reciprocating Saw (To cut Inspection & Maintenance Port and Receiving Holes)
- Dead Blow Mallet
- Worktable (3/4" plywood placed on saw horses works well)
- Hog Ring Gun and Rings for Gabion (if specified)
- Level
- Torch (etc) to "weld" geotextile for 'cap & seal' step

MATERIALS YOU WILL NEED:

- Modular Underdrain Panels
- 8oz Non-Woven Geotextile to line excavation
- Microgrid Mesh
- Washed Bridging Stone (Typically 3/8" - 1/2" pea gravel)
- High Flow Biofiltration Media
- Base Material (95% compactable angular stone (1/2" – 1 1/2") or coarse sand
- Pipe Boot Kits (If not using kits, you will need duct tape and a stainless steel band clamp for each inlet and outlet pipe, and for each inspection or maintenance port.)
- Pipe for Inspection and Maintenance Ports (Typically 6" or 12" SCH 40 PVC)
- Pipe Cap & Serialized FocalPoint Identification Cover
- Gabion basket(s) or other energy dissipation device (If Specified)
- Rock (For Gabions or Flow Dissipation, if Specified)
- Aged, Double Shredded Hardwood Bark Mulch, which has been screened to remove fines
- 10-33mm EPDM, or other impermeable material sized to cover the surface of the media bed, if the system will not be immediately activated.

EQUIPMENT YOU WILL NEED:

- Forklift and other equipment/tools needed to unload box truck
- Walk behind trench roller (plate compactor may also work)

Note: This list does not include equipment or tools needed to excavate or level the floor of the excavation

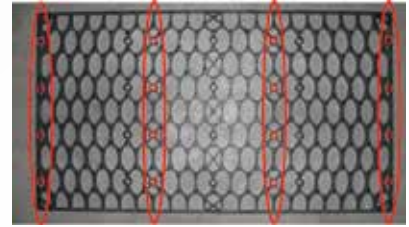


1

ASSEMBLE MODULAR UNDERDRAIN

If Modular Underdrain units arrive on your project in flat panels they will need to be assembled on-site. Assembling the units should take 2-3 minutes per module. This is a conservative estimate used to approximate the total man hours needed for assembly. The estimate includes the workers doing the assembly as well as material handling people to keep the assembly workers moving.

Figure 1: Attach small plates at locations marked in red. The holes to be used for the middle panels are centered on an "X"



Unit	Mini	Single	Double	Triple	Quadruple	Penta
Time	2-3 minutes	2-3 minutes	4-6 minutes	6-9 minutes	8-12 minutes	10-15 minutes

Assembly Instructions – following the drawings in Fig. 2: Connect four small panels (B) into one large panel (A) using the short pegs (not the long pegs). Attach small panels onto the large panel at the locations marked in red on Fig. 1. Do NOT use the row of pin holes directly in the center or the two interior rows nearest the edges, as marked in red on Fig. 1.

Next, working from one end to the other, attach a second large plate (A) on the opposite side of the first.

Once the top and bottom large plates are attached, two more side plates (A) are attached to complete the sides of the Modular Underdrain unit. The picture in figure 2 shows is a SINGLE MINI Modular Underdrain. A single modular underdrain unit will be assembled in the same manner.

To build a DOUBLE unit (or larger), follow the directions above, starting at "Assembly Instructions:" using the top of the existing unit as the large plate. Bottom of the next module.



Figure 2: Follow these steps to assemble the underdrain units



Figure 3: Assembling on site during excavation will increase speed once the excavation is completed

TIP: To increase the speed of the installation, many contractors choose to assemble the Modular Underdrain units prior to or during excavation (Step 2) and base preparation (Step 3) (Fig. 3). Other contractors wait until these steps are completed and then perform the assembly IN THE EXCAVATION allowing completed units to be placed into their final location as they are assembled. Consider which option will work best for your project.



2

EXCAVATE

Excavate the designated area according to plans.

Typical excavations should include:

- One foot perimeter around underdrain modules to allow for proper compaction of backfill
- Enough depth to accommodate a minimum 3" base (if required) below the underdrain modules

Level the bottom of the excavation (Fig. 4) as shown on plans. Most excavations have a flat bottom while some will slightly slope toward the outlet pipe.



Figure 4: Excavation according to plans, following all governmental regulations

Prepare the subgrade according to plans. This could require compaction for stability or prohibit compaction to promote infiltration.

If the subgrade is pumping or appears excessively soft, the design engineer should be consulted for advice. In many cases a stabilization geotextile and 6" of compactable material that drains well will be sufficient to amend the bearing capacity of the soil.

3

PREPARE BASE

Standing water in the excavation will prevent proper base preparation and must be removed, if present. In regions with sandy soils meeting the requirements noted and where the subgrade elevation is above the groundwater table, imported base materials may not be needed.

Base materials must be:

Compaction	95% Compaction (If infiltration is not a primary goal)
Shape	Angular
Size	Not larger than 1.5" in diameter
Consistency	Free of lumps, debris, and sharp objects that could cut geotextile
Applicability	Stone or coarse sand is acceptable if it meets requirements; In no case shall clays be used

Grade and level base as shown on plans.



TIP: Creating a smooth, level platform will allow for faster installation of Modular Underdrain, as units will fit together evenly, eliminating detail work that can delay your progress (Figure 5)

Figure 5: Base must be smooth to ensure units fit together without gaps



4

PLACE GEOTEXTILE ENVELOPE

Geotextile will be required on all FocalPoint HPMBS installations to separate the surrounding in-situ soils from the FocalPoint System. Check your plans to ensure that geotextile is to line your entire excavation, or will only be placed on the sides (if infiltration is a primary goal).

Cut full-width strips of Geotextile to the proper length and place them over the base and up the sides of the excavation, covering the floor and beyond walls of the excavation. This will be important in fulfilling step 11.

IMPORTANT: Allow enough geotextile to wrap the top of the system. This will aid in protecting the system until the site is completely stabilized and ready for activation.

Geotextiles are flammable. No smoking should be permitted on the geotextile.

Adjacent panels of material should be overlapped by 12" or more, as shown on the plans (Fig. 6).

Use pins, staples, sandbags or other ballast to hold the geotextile in place, preventing it from blowing or sliding out of position.

TIP: A prefabricated geotextile envelopes are available for smaller systems. This helps cut down waste and speeds up the installation process (Fig.7)



Figure 6: Roll out geotextile cut to fit the excavation in order to keep in-situ soils from migrating into the FocalPoint System. Geotextile strips must be cut generously in order to cover entire excavation on completion of the installation.

5

INSTALL MODULAR UNDERDRAIN

Determine the starting location. It is often helpful to use an inlet or outlet pipe to guide you. Using a string line, establish two adjacent edges of the Modular Underdrain footprint. Ensure that your corner is square. Mark these two edges with marking paint and remove the string line (Fig. 8).



5

INSTALL MODULAR UNDERDRAIN continued

Begin placing Modular Underdrain in the corner of the marked area. Do NOT place units on their sides, as this will void the warranty. Check your plans to ensure correct orientation of the Modular Underdrain (Fig. 9).

Check the plans to ensure the Modular Underdrain is running in the correct direction (North/South vs. East/West) to match the footprint shown.

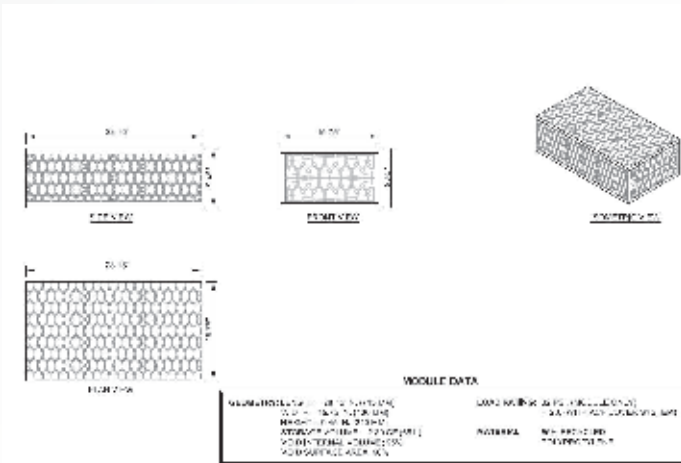


Figure 9: Make sure the tanks are oriented properly in the excavation.



Figure 8: Place modular underdrain in specified configuration within geotextile envelope.



Figure 9A: Minor Variations (less than width of top plate) in tank height are acceptable

Modular Underdrain units should fit together evenly. Minor gaps between units ($< \frac{1}{2}$ ") or variations in the height of the units ($< \frac{1}{2}$ ") are acceptable (Fig. 9A), but reasonable efforts should be made to minimize these variations. Minor gaps will be eliminated during compaction of side backfill material.

No lateral connections between adjacent underdrains modules are required.



6 INSTALL INSPECTION/MAINTENANCE PORTS

All ports should be made from pipe long enough to extend from the bottom of the Modular Underdrain to a point slightly above finished grade of the FocalPoint HPMBs. Taller is better, as the pipes can be trimmed on completion of the system installation. They are typically Schedule 40 PVC pipe, but can be formed from other types of pipe, as well.



Figure 11: 8" slots cut in to bottom of inspection port caps

Identify the location of all ports as specified on the approved drawings and remove the Underdrain Module(s) which will receive the port from each location.

Cut the pipe to length, leaving enough excess to trim the top when final grade is reached.

Cut several horizontal slots in the pipe starting at the bottom (Fig. 11). Slots should extend as high as the height of the lowest underdrain module being used. No perforations or slots should be visible above the top of the Modular Underdrain once the port is in place.

Using a reciprocating saw, cut the horizontal underdrain module plates in the center, between the two internal vertical plates, to receive the port (Fig. 12). Cut the openings for a tight fit around the port pipe. If the pipe specified will not fit between the two interior plates, one or both plates may be moved to the outer connection locations on the large plate. All horizontally oriented plates will need to be cut EXCEPT FOR THE BOTTOM PLATE. In total you will need to cut:

Unit	Cut
Mini & Single	1 plate
Double	2 plates
Triple	3 plates
Quadruple	4 plates
Penta	5 plates

TIP: If the location of the inspection ports is not shown on your plans, use a single inspection port located in the middle of the underdrain field. Install a port for every X sf of the underdrain system

IMPORTANT: Do not over-cut the Modular Underdrain plates. Minimize the gaps between the pipe and the Modular Underdrain plates. This is particularly important with the top plate.

For all units larger than a Single or Mini Underdrain Module, you will need to disassemble the Underdrain module in order to cut the interior horizontal plates. Reassemble the Underdrain Module when cutting is completed, and replace the Underdrain Module into the proper location.

TIP: If using Prefabricated Pipe Boot Kits, install them onto the pipe now, leaving the band clamps loose so that final adjustments may be made in Step 7.

Install the pipe into the Underdrain Modules.

Place the port pipe with pre-cut slots into hole. (Fig. 13). Be sure to cut the top of the pipe so that once the FocalPoint HPMBs Inspection Port Cap is placed onto the top of the pipe, the top of the Inspection Port Cap will be flush with or just above the finished grade. Once the pipe is in place, put the FocalPoint inspection port Cap or a temporary cap on the port to prevent debris from entering the system during backfill procedures (Fig. 14).



Figure 12: Cut 6" Hole into top panel of underdrain module to accommodate 6" pipe



Figure 13: Place inspection port into underdrain module



Figure 14: Cut inspection port to appropriate height stated on plans. Seal the opening on top of the pipe with the FocalPoint Inspection Port Cap or temporary lid



7 INSTALL MICROGRID MESH

Clean off any debris that may be lying on top of the exposed geotextile around the perimeter of the Modular Underdrain.

Cut strips of Microgrid Mesh to fit over the top and down both sides of the modular underdrain system. Adjacent strips of Mesh should overlap at least 12" or as shown on plans. Use rock bags or other ballast to temporarily secure overlaps (Fig. 15).

Where Modular underdrain intersects an Inspection or Maintenance Port, cut an "X" into the geotextile and pull it over the pipe. The flaps of the "X" should point AWAY from the Modular Underdrain (Fig. 16). Use stainless steel band clamp to seal the flaps to the pipe, being careful not to leave gaps that will allow bridging stone to enter the underdrain.

IMPORTANT: Take special care with Inside Corners on the footprint of the system. Cut Microgrid Mesh as needed to ensure that it lays flat against the Modular Underdrain. Use additional pieces to seal the corner and any cuts that are made (12" overlap).



Figure 15 (Above): 12" overlap of Biaxial Mesh on top of underdrain module



Figure 16 (Below): Cut an "X" into Biaxial Mesh to accommodate pipe penetration



Figure 17: fold corners flat against the tank

Fold Mesh for outside corners similar to sheets on a bed, and lay excess material flat against Modular Underdrain. Leave corners loose to avoid creating weak spots in the material. Temporarily secure excess fabric with duct tape (Fig. 17 left).

TIP: If using Prefabricated Pipe Boot Kits, install them onto the Inlet and Outlet Pipes, leaving the band clamps loose so that final adjustments may be made.

Connect Inlet & Outlet Pipes

Where the inlet and outlet pipes connect to an underdrain module or exits the excavation, cut an "X" into the Microgrid Mesh or geotextile so that the pipe runs through the Microgrid and makes DIRECT contact with the underdrain module (Fig. 18). Pull the flaps of the "X" cut over the pipe so that the flaps of the "X" point AWAY from underdrain module. Use a stainless steel band clamp to seal the flaps to the pipe, being careful not to leave gaps that will allow bridging stone to enter the underdrain.



Figure 18: Cut "X" in Biaxial Mesh and Geotextile to accommodate outlet pipes and seal with stainless steel band clamps



8

BACKFILL SIDES & TOP WITH PEAGRAVEL

Backfill bridging stone material around perimeter of the underdrain modules, distributing the material evenly to prevent shoving of the underdrain modules.

Use a trench roller, plate compactor, or hand tamper to compact backfill. When using taller underdrain modules, this placement and compaction should be done in 12" lifts.

Continue placing and compacting backfill around underdrain modules until the bridging stone reaches the top of the underdrain modules. Once bridging stone is level with the top of the underdrain, place 6" of bridging stone (or as specified) on top of underdrain modules (Fig 20).



Figure 19: Compaction of side is critical in order to keep soils from settling around the tank.

Figure 20 (Above): Place 6" of bridging stone on top of Microgrid Mesh

Figure 21 (Right): Use Inspection Port as marker for bridging stone depth

9

PLACE HIGH PERFORMANCE BIOFILTRATION SOILS

Level bridging stone and, place 6" of high flow media on top. Use marked stakes to ensure elevations. Once 6" of media has been placed, set Gabions (if applicable). Once Gabions have been installed, continue placing media until it is at the specified depth, (typically 18"). The top of the media should be 6" below the top of the gabion wall (if specified).

TIP: Before you place bridging stone use your inspection port to mark the different levels of fill as specified (Figure 20)

WARNING High Flow Media is a highly engineered soil - do not mix media with any other site, fill or excavated soils.



Figure 22: Place biofiltration soils, being careful not to mix with any other site soils, to specified depth



Figure 23: Level Soils once they are filled to specified depth

**10**

PLACE & FILL GABION (IF SPECIFIED)

(If gabion surround or leading edge is not specified continue to step 11)

Gabions are an optional feature that may not be included on your installation. If they are not included, skip this step and proceed to Step 11.

The gabion baskets are 12" tall. The interior dimensions of the gabion baskets needs to be equal to the exterior diameter of the underdrain unless specified otherwise. The top of the gabion should rise 6" above the top of the high flow media and 3" above the bark mulch.

Place a geotextile separation barrier between the gabion and existing site soils as well as the gabion and media so that soil will not migrate into the rock creating a void. (Figure 24).

Once the gabion baskets are placed, overfill the gabions with 3" x 5" washed bull rock, or other specified material. Once filled, seal the baskets with hog rings placed every three inches so that rock cannot be removed.

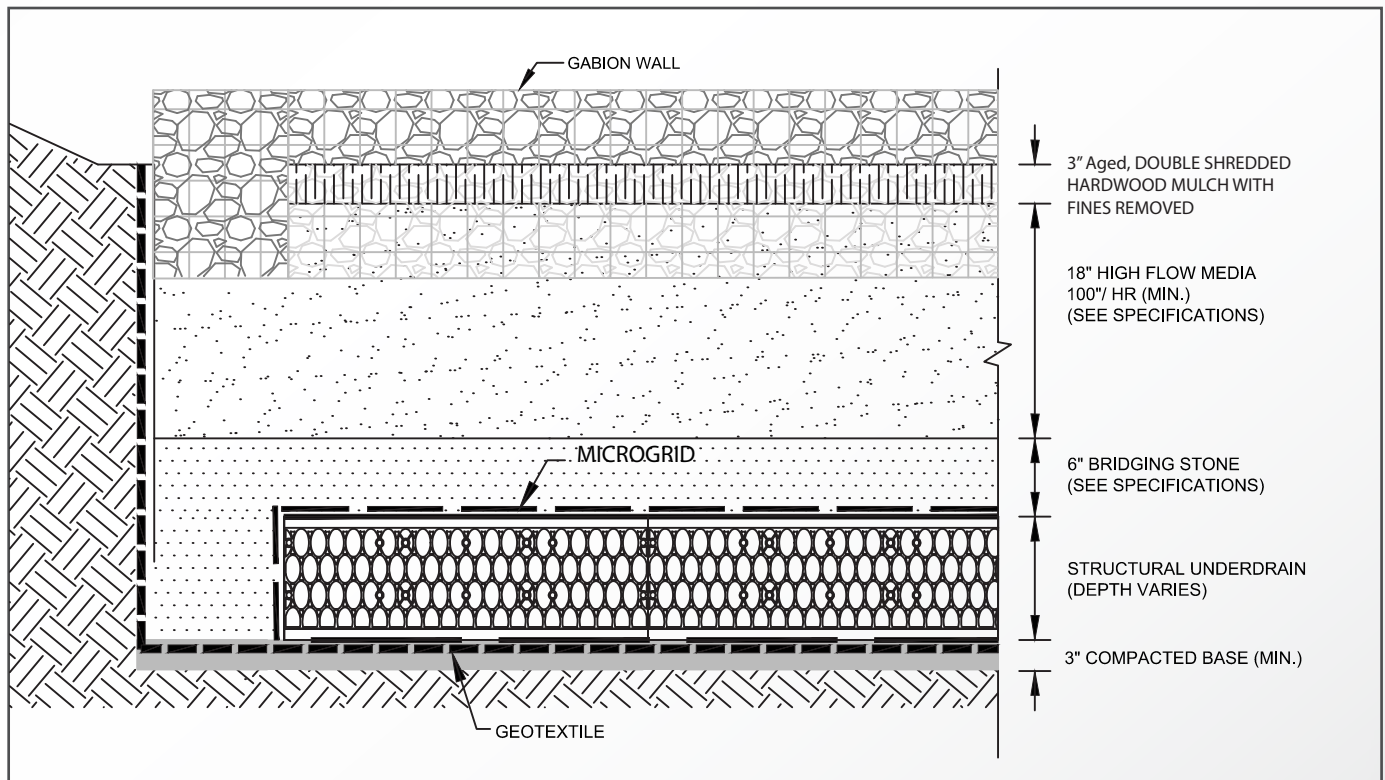


Figure 24: Place gabion wall so that it is square and level



Figure 25: Overfill rock into gabion and seal tight to prevent sagging. Rock will settle over time.

Figure 26





11

CAP & SEAL

This step protects the system if it is not to be immediately activated. The system should not be activated (plantings and mulch placed, and stormwater allowed to flow into system) until the surrounding drainage area reaches at least 90% stabilization. Premature activation and/or failure to carry out this 'cap & seal' step may invalidate the warranty on this system.

Protecting the FocalPoint HPMBs during construction is of the utmost importance. The sediment contained in the runoff from an un-stabilized drainage area may contaminate the biofiltration media, reduce the effectiveness of the FocalPoint HPMBs or cause failure.

Cut an appropriately sized piece of impermeable material (10-33mm) to fit the surface of the media bed. If multiple pieces are required, weld/glue them together to create an impermeable seal over the media bed.

Place the impermeable cover over the media bed.

Pull excess Geotextile Excavation Liner (see step 4) over the top of the FocalPoint System, fully cover the impermeable seal, overlapping the geotextile to fully prevent silt and sediment from reaching the seal and underlying media. Using a portable blow torch to 'heat weld' the geotextile and prevent the geotextile from moving or opening. You should practice this procedure on scrap material away from the system prior to attempting to do it over the system. Non-woven geotextiles are flammable and you must take extreme caution in doing this so that you do not leave the torch on the geotextile for too long. This procedure will create a perfect seam that will prevent sediment from bypassing the geotextile (Figure 29). If you cut your fabric too short, just make a patch for the uncovered area with another piece of geotextile, welding it all the way around.

Once the system is capped and sealed, use a sign or any other warning mechanism to warn other contractors not to remove the cover until activation is authorized (Figure 31). This will protect the system until final stabilization. Other erosion control mechanisms may be required upstream of the FocalPoint HPMBs such as check dams, erosion control blankets, wattles or other best management practices. Please contact your local Convergent Value Added Reseller for suggestions.

WARNING

FAILURE TO INSTALL AND MAINTAIN ADEQUATE ESC PROTECTION FOR THE FOCALPOINT MAY VOID THE WARRANTY AND PERFORMANCE GUARANTEES.



Figure 30: A hose extension added to a blow torch.

TIP: If you add a hose extension onto the torch, it makes the procedure much easier.



Figure 29: Geotextile being melted together with a torch.

Figure 31: FocalPoint Warning Sign



CAUTION: BIOFILTRATION SYSTEM

DO NOT REMOVE GEOTEXTILE COVER
No quite la cubierta geotextil

DO NOT PLACE SOIL ON TOP OF ENGINEERED MEDIA OR COVER
No coloque tierra en la parte superior de la cubierta protectora

DO NOT STOCKPILE DIRT OR HAZARDOUS MATERIAL UPSTREAM
No acumular tierra o materiales peligrosos en el canal de drenaje

CAUTION: This FocalPoint Biofiltration System is an engineered stormwater treatment system. It must not be compromised prior to activation by Construction EcoServices. Do not remove the protective geotextile.

PRECAUCIÓN: FocalPoint Biofiltration System es un sistema de tratamiento de agua de lluvias. La cubierta protectora no debe ser removida o abierta, antes de ser activado solamente por Construction EcoServices.

ACTIVATION PREREQUISITES.
Requisitos de activación

70% OF THE DRAINAGE AREA MUST BE STABILIZED
El 70% del área que rodea el drenaje debe ser estabilizado

STREET/PARKING MUST BE SWEEPED
La calle/estacionamiento debe ser barrido

90% OF THE SWALE MUST BE VEGETATED OR MULCHED
El 90% del canal de drenaje debe tener por debajo vegetación o mulch

CONTACT CONSTRUCTION ECOSERVICES FOR ACTIVATION
Comuníquese con Construction EcoServices para la activación
832.456.1000


CONSTRUCTION

WWW.ECOSVS.COM



12

ACTIVATE THE SYSTEM

Once 90% stabilization has been achieved; contact your local Convergent Water Technologies Value Added Reseller (www.convergentwater.com) for activation. Activation includes removing the protective 'cap and seal' cover on the biofiltration media bed and in situ testing of the media to insure that it meets performance specifications by means of an hydraulic conductivity test. This activation is provided by Convergent's VAR at no additional charge. At this time you may add specified plants to the media bed and the 3" non-floatable mulch layer if indicated (typical).

IMPORTANT:

The FocalPoint HPMBs should always remain capped until 90% stabilization is achieved and be the last thing planted to ensure that construction sediment does not enter the system.



Figure 33: Planted FocalPoint HPMBs



Figure 32: Protected FocalPoint HPMBs

WARNING

FAILURE TO CONFORM TO THIS STEP MAY VOID THE WARRANTY AND PERFORMANCE GUARANTEE. FOR THE FOCALPOINT HPMBs ACTIVATION CHECKLIST, CONTACT YOUR VALUE ADDED RESELLER.



13

PLANTINGS & MULCH

Placing the Plants:

1. Dig planting holes the depth of the root ball and two to three times as wide as the root ball. Wide holes encourage horizontal root growth that plants naturally produce.
2. With trees, you must ensure you are not planting too deep!! Don't dig holes deeper than root balls. The media should be placed at the root collar, not above the root collar; otherwise the stem will be vulnerable to disease.

Planting:

1. Remove plastic containers from container-grown plants. For plants in fiber pots, break away the top or remove the pot entirely.

2. If roots are circling around the root ball exterior, cut through the roots in a few places and remove the first inch of roots and planting material around the root ball. Cutting helps prevent circling roots from eventually girdling the trunk. If roots are not circling, the root ball should still be rubbed to loosen roots and promote growth into the media.

3. Remove tags and labels from plants.

4. Prune broken branches or suckers.

5. Only stake trees with large crowns, or those situated on windy sites or where people may push them over. Stake for a maximum of one year. Allow trees a slight amount of flex rather than holding them rigidly in place. Use guying or attach material that won't damage the bark. To prevent trunk girdling, remove all guying material after one year. Insure that stakes do not penetrate the bridging stone or underlying modular drainage system.

6. Plants should be watered at planting, especially during drought periods.

SPACING		
Type of Planting	Rootball Size	Spacing on Center
Shrubs	< 1 gallon	24 inches
Shrubs	5 gallons	42 inches
Shrubs	15 gallon	60 inches
Clump Grasses		24 inches
Small Trees		12 feet

DO NOT:

- Mulch in excess of 3 inches
- Compact media around the root ball
- Do not use annuals
- Keep in mind that some perennials (i.e. daylilies, hostas, etc...) die back in fall and re-emerge in spring. If you want greenery year round, be mindful of the perennials used.

Mulching:

Cover the exposed root ball top with mulch. No mulch volcanoes! Mulch should not touch the plant base because it can hold too much moisture and invite disease and insects. Evenly place 3 inches of double shredded, aged hardwood mulch which has been screened to remove fines, on the surface of the media (if specified).

Erosion Control:

Where water is entering a focal point in one location, be sure to place erosion control stones or other scour prevention BMP to prevent scouring



14

PERFORMANCE VERIFICATION

The Rub-I Infiltrometer is the most effective way to field verify engineered soil performance, construction and long term verification of performance. The Rub-I was designed to test the effectiveness of high flow soils and to ensure post control. Current ASTM standards for infiltration testing are not valid for flow rates exceeding 16 in/hr. To ensure the highest level of effectiveness, Convergent specifies that the FocalPoint HPMBs be tested within 60 days of installation and we recommend the system be tested annually thereafter to provide ongoing quality assurance.

Objective:

To provide as-built confirmation of proper installation and hydraulic performance, to meet minimum high flow rate Infiltration rate requirements, of bioretention media on newly-placed bioretention systems. This procedure measures the entire media profile under saturated conditions to insure a reliable and accurate result.

Example Site Test Layout and Design Schematic:

(FSA = filter surface area, DA = drainage area)

For bioretention systems with a surface area less than 538 sf, in situ hydraulic testing should be conducted at one to three points that are spatially distributed. For systems with a surface area greater than 50 sf, an extra monitoring point should be added for every additional 1076 sf. (Values are based on recommendations from the Facility for Advancing Water Biofiltration.) Testing should be performed near the perimeter since this is the area most likely to be impacted by sediment in the runoff.

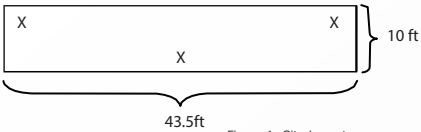
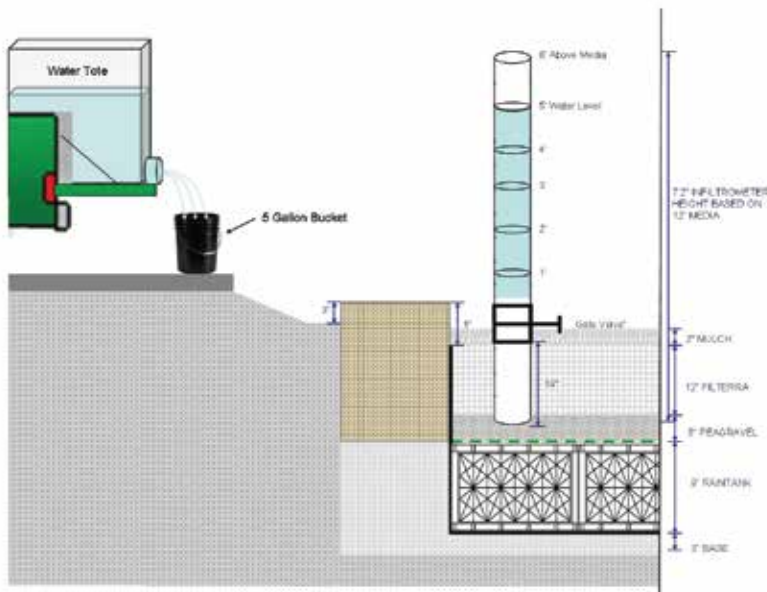


Figure 1: Site Layout

Media Depth (inches)	Max Drawdown Time (min:sec)
12	18:18
14	21:24
16	24:18
18	27:00
20	29:30
22	31:54
24	34:06
26	36:12
28	38:12
30	40:00
32	41:42
34	43:24
36	44:54
38	46:18
40	47:42
42	49:00
44	50:12
46	51:24
48	52:30

Test Methodology:

In an area near the location you plan to test, gently scrape away any material covering (e.g. mulch, gravel, leaves) filter media surface and confirm media profile depth by using a shovel to dig to under drain stone and place measuring tape in hole to determine depth from top of under drain stone to top of media bed. A flash light may be needed to ensure the under drain stone has been reached before a depth measurement is taken. Make every effort to minimize disturbance of surrounding media and underlying bridging stone.



14

PERFORMANCE & VERIFICATION *continued*



Figure 3: Hammering Pipe Into Media



Figure 4: Pipe Installed Into Media



Figure 5: Oil Application



Figure 6: Dissipater Stones



Figure 7: Infiltrator Placement

1. At the test location carefully clear away mulch without disturbing the underlying media and place base component of the Rub-I infiltrator, a 6" PVC pipe (beveled end down), on the surface of the media. Ensure testing is not too close to vegetation. Place the wooden board over the pipe and then gently pound with the sledge hammer on top of the board (Figure 3). Hammer the PVC pipe into the entire media profile based on the depth previously determined, until it just breaches into the bridging stone. Drive the pipe straight down, avoiding tilt in any direction (Figure 4). Check with level. Note: It is important that the pipe is driven in slowly and carefully to minimize disturbance of the filter media profile. The media may slightly move downward in the pipe during hammering, but not more than 1 inch, and will not significantly affect hydraulic performance.

2. If pipe is less than 3 inches from media surface, remove media around outside of pipe so that the pipe has 3 inches of freedom from the media bed so that the infiltrator gate valve coupling will properly slide onto the pipe.

3. Remove board and rub mineral oil on outside of PVC pipe above media (Figure 5).

4. Place 2 inch dissipater stones into pipe (Figure 6).

5. Slide gate valve with clear PVC cylinder down onto the PVC pipe in the media (Figure 7). Note: Disregard black coupling on clear pipe as well as pipe plug in this image.

6. Measure from the original surface of the media within the column to 1 ft, 2 ft, 3 ft, 4 ft and 5 ft gradations, and mark them on the clear PVC cylinder (Figure 8). The 1 ft and 5 ft marks are the critical marks, since the time to fall between these two intervals will provide the pass/fail time for the test. (The time at other intervals between 1 ft and 5 ft can be recorded for additional information, but will not be used in the pass/fail criteria).

7. Fill a 5 gallon bucket with 3 gallons of water.

8. Ensure the gate valve to the infiltrator is closed. Fill with the 3 gallons of water (Figure 9). To create a worst case flow rate scenario (i.e. saturated condition), an initial wetting of the media using the infiltrator is conducted by opening up the gate valve completely. The gate valve should be slowly opened by tapping on the handle with a hammer or wrench to prevent disturbance of the media surface by a sudden high flow of water. Pulling open by hand tends to force the valve open too quickly.

9. After the water level disappears from the clear column, a drain down time of 25 minutes is allowed to ensure free water has drained through the media.

10. After 25 minutes, ensure the gate valve is closed. Fill the 5 gallon bucket with water and continue to fill the column until water level reaches the very top of the clear pipe. Water is then re-introduced by opening the gate valve slowly by tapping the handle. A stopwatch should be started as the water level reaches 5 ft gradation and recorded at every 1 ft gradation. The stopwatch is stopped when the water level reaches the 1 ft mark.

11. Pass/fail criteria is based on maximum drawdown times (Table 1). For example, a media profile depth of 12 inches should not exceed a drawdown time of 18 minutes and 18 seconds between the 5 ft and 1 ft gradations.

For bioretention systems with a surface area less than 538 sf, in situ hydraulic testing should be conducted at one to three points that are spatially distributed. For systems with a surface area greater than 50 sf, an extra monitoring point should be added for every additional 1076 sf. These values are based on recommendations from the Facility.



Figure 8: Gradation of Clear Pipe



Figure 9: Filling Infiltrator with Water

For information on components & assembly of Rub - I Infiltrator see the SOP (Standard Operating Procedure) document available from your Convergent VAR

R-Tank Underdrain System Operation, Maintenance, and Management Inspection Checklist

Project:

Date:

Location:

Time:

Site Status:

Inspector:

Notes:

- Beyond inspection frequency noted in parenthesis, i.e. (quarterly), inspections shall be completed after storms equal to or greater than the 1-year 24-hour Type III storm event (2.7" of rain fall)
- All Checklist Maintenance items are MANDATORY.
- During inspections, if maintenance items are found not to be applicable, note as N/A in comments
- All removed sediments shall be disposed at an approved and permitted location.
- All hazardous debris removed shall be disposed of in accordance with state and federal regulations by a properly licensed contractor
- Clean, repair or complete replacement to Underground Treatment System Practice is required if system fails to infiltrate/drain fully within 48 hours.
- Refer to the guidelines for R-Tank systems provided by Manufacturer for required inspection and maintenance information and proper procedures.
- Inspection Ports are centrally located in the R-Tank system to give a baseline sediment depth across the system floor. Maintenance ports/manholes are located at the system inlet and outlet connections

MAINTENANCE ITEM	SATISFACTORY (YES/NO)	COMMENTS
1. Debris Cleanout (Quarterly or Semi-Annually)		
Inspection ports and maintenance ports are clear of debris/ floatables or accumulated sediment.		
Inflow pipes clear of debris/ floatables		
Outflow pipes clear of debris/ floatables		
Access/outlet manholes clear of debris/ floatables		
2. Dewatering (Annual)		

**R-Tank Underdrain System
Operation, Maintenance, and Management
Inspection Checklist**

Project:

Date:

Location:

Time:

Site Status:

Inspector:

R-tanks dewater/drain between storms		
Outlet devices shall be cleaned/repared when draw down exceeds 36 hours.		

3. Sediment Cleanout of System (Annual)

No evidence of sedimentation in R-Tank System		
Sedimentation accumulation doesn't yet require cleanout		
Sediment shall be removed from the system when sediment depth 15% or 6" of the R-Tank height, whichever is less.		
Remove sediments by hydro-jetting of sediments and vactoring (vacuuming). Water should be pumped into all Maintenance Ports.		

5. System Drain Down Performance

Ponding evident in any component 48 hours after storm event? Y/N		
If yes, check and clean out all inlets and outlets to/ from entire underground system.		
Jet Vacuum system and all ancillary components including the system outlet control structure.		
If drain down of any component still exceeds 48 hours, consult qualified, professional assistance to restore drain down performance to 48 hours or less. Complete replacement of component(s) or entire system may be required.		

**R-Tank Underdrain System
Operation, Maintenance, and Management
Inspection Checklist**

Project:

Date:

Location:

Time:

Site Status:

Inspector:

COMMENTS:

ACTIONS TO BE TAKEN:



R-TANK OPERATION, INSPECTION & MAINTENANCE

Operation

Your ACF R-Tank System has been designed to function in conjunction with the engineered drainage system on your site, the existing municipal infrastructure, and/or the existing soils and geography of the receiving watershed. Unless your site included certain unique and rare features, the operation of your R-Tank System will be driven by naturally occurring systems and will function autonomously. However, upholding a proper schedule of Inspection & Maintenance is critical to ensuring continued functionality and optimum performance of the system.

Inspection

Both the R-Tank and all stormwater pre-treatment features incorporated into your site must be inspected regularly. Inspection frequency for your system must be determined based on the contributing drainage area, but should never exceed one year between inspections (six months during the first year of operation).

Inspections may be required more frequently for pre-treatment systems. You should refer to the manufacturer requirements for the proper inspection schedule.

With the right equipment your inspection and measurements can be accomplished from the surface without physically entering any confined spaces. If your inspection does require confined space entry, you **MUST** follow all local/regional requirements as well as OSHA standards.

R-Tank Systems may incorporate Inspection Ports, Maintenance Ports, and/or adjoining manholes. Each of these features are easily accessed by removing the lid at the surface. With the cover removed, a visual inspection can be performed to identify sediment deposits within the structure. Using a flashlight, ALL access points should be examined to complete a thorough inspection.

Inspection Ports

Usually located centrally in the R-Tank System, these perforated columns are designed to give the user a base-line sediment depth across the system floor.

Maintenance Ports

Usually located near the inlet and outlet connections, you'll likely find deeper deposits of heavier sediments when compared to the Inspection Ports.

Manholes

Most systems will include at least two manholes - one at the inlet and another at the outlet. There may be more than one location where stormwater enters the system, which would result in additional manholes to inspect.

Bear in mind that these manholes often include a sump below the invert of the pipe connecting to the R-Tank. These sumps are designed to capture sediment before it reaches the R-Tank, and they should be kept clean to ensure they function properly. However, existence of sediment in the sump does **NOT** necessarily mean sediment has accumulated in the R-Tank.

After inspecting the bottom of the structure, use a mirror on a pole (or some other device) to check for sediment or debris in the pipe connecting to the R-Tank.

R-TANK OPERATION INSPECTION & MAINTENANCE

If sediment or debris is observed in any of these structures, you should determine the depth of the material. This is typically accomplished with a stadia rod, but you should determine the best way to obtain the measurement.

All observations and measurements should be recorded on an Inspection Log kept on file. We've included a form you can use at the end of this guideline.

Maintenance

The R-Tank System should be back-flushed once sediment accumulation has reached 6" or 15% of the total system height. Use the chart below as a guideline to determine the point at which maintenance is required on your system.

R-Tank Unit	Height	Max Sediment Dept
Mini	9.5"	1.5"
Single	17"	3"
Double	34"	5"
Triple	50"	6"
Quad	67"	6"
Pent	84"	6"

Before any maintenance is performed on your system, be sure to plug the outlet pipe to prevent contamination of the adjacent systems.

To back-flush the R-Tank, water is pumped into the system through the Maintenance Ports as rapidly as possible. Water should be pumped into ALL Maintenance Ports. The turbulent action of the water moving through the R-Tank will suspend sediments which may then be pumped out.

If your system includes an Outlet Structure, this will be the ideal location to pump contaminated water out of the system. However, removal of back-flush water may be accomplished through the Maintenance Ports, as well.

For systems with large footprints that would require extensive volumes of water to properly flush the system, you should consider performing your maintenance within 24 hours of a rain event. Stormwater entering the system will aid in the suspension of sediments and reduce the volume of water required to properly flush the system.

Once removed, sediment-laden water may be captured for disposal or pumped through a Dirtbag™ (if permitted by the locality).



2831 Cardwell Road
Richmond, Virginia, 23234
800.448.3636
FAX 804.743.7779
acfenvironmental.com

Step-By-Step Inspection & Maintenance Routine

1) Inspection

- a. Inspection Port
 - i. Remove Cap
 - ii. Use flashlight to detect sediment deposits
 - iii. If present, measure sediment depth with stadia rod
 - iv. Record results on Maintenance Log
 - v. Replace Cap
- b. Maintenance Port/s
 - i. Remove Cap
 - ii. Use flashlight to detect sediment deposits
 - iii. If present, measure sediment depth with stadia rod
 - iv. Record results on Maintenance Log
 - v. Replace Cap
 - vi. Repeat for ALL Maintenance Ports
- c. Adjacent Manholes
 - i. Remove Cover
 - ii. Use flashlight to detect sediment deposits
 - iii. If present, measure sediment depth with stadia rod, accounting for depth of sump (if present)
 - iv. Inspect pipes connecting to R-Tank
 - v. Record results on Maintenance Log
 - vi. Replace Cover
 - vii. Repeat for ALL Manholes that connect to the R-Tank

2) Maintenance

- a. Plug system outlet to prevent discharge of back-flush water
- b. Determine best location to pump out back-flush water
- c. Remove Cap from Maintenance Port
- d. Pump water as rapidly as possible (without over-topping port) into system until at least 1" of water covers system bottom
- e. Replace Cap
- f. Repeat at ALL Maintenance Ports
- g. Pump out back-flush water to complete back-flushing
- h. Vacuum all adjacent structures and any other structures or stormwater pre-treatment systems that require attention
- i. Sediment-laden water may be captured for disposal or pumped through a Dirtbag™.
- j. Replace any remaining Caps or Covers
- k. Record the back-flushing event in your Maintenance Log with any relevant specifics



R-Tank Maintenance Log

Company Responsible for Maintenance:

Site Name: _____

Location:_____

Contact:_____

System Owner: _____

Phone Number: _____

[illegible]

Appendix B – RIDEM Sample Stormwater Facility Maintenance Agreement

****A site-specific Stormwater Facility Maintenance Agreement between the Owner and the responsible authority must be developed prior to construction****

Sample Stormwater Facility Maintenance Agreement

THIS AGREEMENT, made and entered into this ____ day of _____, 20____, by and between (Insert Full Name of Owner)

_____, hereinafter called the "Landowner", and the [Local Jurisdiction], hereinafter called the "[Town/City]".

WITNESSETH, that WHEREAS, the Landowner is the owner of certain real property described as (Tax Map/Parcel Identification Number) _____

as recorded by deed in the land records of [Local Jurisdiction] Deed Book _____ Page _____, hereinafter called the "Property".

WHEREAS, the Landowner is proceeding to build on and develop the property; and WHEREAS, the Site Plan/Subdivision Plan known as

_____, (Name of Plan/Development) hereinafter called the "Plan", which is expressly made a part hereof, as approved or to be approved by the [Town/City], provides for detention of stormwater within the confines of the property; and

WHEREAS, the [Town/City] and the Landowner, its successors and assigns, including any homeowners association, agree that the health, safety, and welfare of the residents of [Local Jurisdiction] require that on-site stormwater management facilities be constructed and maintained on the Property; and

WHEREAS, the [Town/City] requires that on-site stormwater management facilities as shown on the Plan be constructed and adequately maintained by the Landowner, its successors and assigns, including any homeowners association.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The on-site stormwater management facilities shall be constructed by the Landowner, its successors and assigns, in accordance with the plans and specifications identified in the Plan.
2. The Landowner, its successors and assigns, including any homeowners association, shall adequately maintain the stormwater management facilities in accordance with the required Operation and Maintenance Plan. This includes all pipes, channels or other conveyances built to convey stormwater to the facility, as well as all structures, improvements, and vegetation provided to control the quantity and quality of the stormwater. Adequate maintenance is herein defined as good working condition so that these facilities are performing their design functions. The Stormwater Best Management Practices Operation, Maintenance and Management Checklists are to be used to establish what good working condition is acceptable to the [Town/City].

-
3. The Landowner, its successors and assigns, shall inspect the stormwater management facility and submit an inspection report annually. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the entire facilities, berms, outlet structure, basin areas, access roads, etc. Deficiencies shall be noted in the inspection report.
 4. The Landowner, its successors and assigns, hereby grant permission to the [Town/City], its authorized agents and employees, to enter upon the Property and to inspect the stormwater management facilities whenever the [Town/City] deems necessary. The purpose of inspection is to follow-up on reported deficiencies and/or to respond to citizen complaints. The [Town/City] shall provide the Landowner, its successors and assigns, copies of the inspection findings and a directive to commence with the repairs if necessary.
 5. In the event the Landowner, its successors and assigns, fails to maintain the stormwater management facilities in good working condition acceptable to the [Town/City], the [Town/City] may enter upon the Property and take whatever steps necessary to correct deficiencies identified in the inspection report and to charge the costs of such repairs to the Landowner, its successors and assigns. This provision shall not be construed to allow the [Town/City] to erect any structure of permanent nature on the land of the Landowner outside of the easement for the stormwater management facilities. It is expressly understood and agreed that the [Town/City] is under no obligation to routinely maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the [Town/City].
 6. The Landowner, its successors and assigns, will perform the work necessary to keep these facilities in good working order as appropriate. In the event a maintenance schedule for the stormwater management facilities (including sediment removal) is outlined on the approved plans, the schedule will be followed.
 7. In the event the [Town/City] pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Landowner, its successors and assigns, shall reimburse the [Town/City] upon demand, within thirty (30) days of receipt thereof for all actual costs incurred by the [Town/City] hereunder.
 8. This Agreement imposes no liability of any kind whatsoever on the [Town/City] and the Landowner agrees to hold the [Town/City] harmless from any liability in the event the stormwater management facilities fail to operate properly.
 9. This Agreement shall be recorded among the land records of [Local Jurisdiction] and shall constitute a covenant running with the land, and shall be binding on the Landowner, its administrators, executors, assigns, heirs and any other successors in interests, including any homeowners association.

WITNESS the following signatures and seals:

Company/Corporation/Partnership Name (Seal)

By: _____

(Type Name and Title)

The foregoing Agreement was acknowledged before me this ____ day of
_____, 20____, by

_____.

NOTARY PUBLIC
My Commission Expires: _____

By: _____

(Type Name and Title)

The foregoing Agreement was acknowledged before me this ____ day of
_____, 20____, by

_____.

NOTARY PUBLIC
My Commission Expires: _____

Approved as to Form:

[Town/City] Attorney Date

Appendix C – FocalPoint Maintenance Letter of Intent



June 24, 2022

Nancy L. Freeman, Principal Environmental Scientist
RIDEM Office of Water Resources
235 Promenade Street
Providence, Rhode Island 02908

**RE: Letter of Intent for Stormwater BMP Maintenance
Seasons Corner Market – Plainfield Pike
Cranston, RI**

Dear Ms. Freeman,

As the Owner and Applicant, we understand the requirement to provide a maintenance contract which extends for a minimum of two years as outlined in the RIDEM Certification for FocalPoint High Performance Biofiltration System (HPMBS), issued October 4, 2021.

The purpose of this letter is to inform RIDEM that a maintenance contract will be in place by the time the device is installed at 2050 Plainfield Pike, Cranston RI 02921 and prior to when the system is brought online, and a copy of this contract will be sent to RIDEM. The maintenance provider will be Stormwater Compliance, LLC or another maintenance provider that has received training from the Convergent Water Technologies on how to properly maintain the FocalPoint HPMBS Device.

If you have any questions, please contact us at 401-943-0005 x356 or at the following email address
Mgazdacko@seasonscornermarket.com

A handwritten signature in blue ink, appearing to read "Michael Gazdacko", is written over the printed name and title.

Michael Gazdacko
Director of Construction
Colbea Enterprises, LLC

Appendix D – Emergency Response Plan

EMERGENCY RESPONSE PLAN

The following guidelines are to be followed in the event of an emergency involving a fire or gas spill 5 gallons or more:

Responsibilities in the event of a fire:

1. Turn off power to the gas pumps
2. Evacuate all persons from the store and parking area, away from the pumps
3. Call 911
4. Secure the parking area to prohibit access by people and vehicles
5. Evacuate yourself from the store and go to your designated safe location. Identify yourself to local authorities upon their arrival

Designated Safe Location: _____

Responsibilities in the event of a gas spill (5 gallons or more):

1. Turn off power to the gas pumps
2. Ensure all smoking materials are extinguished
3. Contain the spill as best you can with spill containment cloths/speedy dry)
4. If the spill extends beyond the grooves, call one of the people listed below in the order that they appear
5. Follow their instructions
6. If they request you call the fire department, use the call procedures listed below.

Responsibilities in the event of a Robbery:

1. After robbery, secure store, lock front door
2. After calling 911, then use calling procedures below

CALLING PROCEDURES

1. Contact the fire or police department by calling 911
2. Tell them you are a Shell Gas Station and give the address: _____
3. Tell them the store phone number. Store Phone number: _____
4. Tell them what the emergency you are reporting is.
5. Tell them what time the emergency occurred.

After calling 911, call one of the following in the order that they appear:

Store Manager		Phone Number
District Manager		Phone Number
Director of Ops	DJ Orr	Phone Number 401-688-4601
Environmental Mgr.	Eric Simpson	Phone Number 508-298-8686
Director of Brands	Mario Vendittelli	Phone Number 401-749-1601
V.P. of Operations	Angelo Ruio	Phone Number 401-241-0828

Local Fire Department Phone Number:

Local Police Department Phone Number: